Rapid Infrastructure Development/Enhancement (RIDE)

Dr. Albert J. Bush, III

PROBLEM

General:

Sealift in Force Projection is Limited By Lack of Adequate Port Facilities

Sealift is Required for Large Throughput Volumes and Force Sustainment

Infrastructure Problems:

Existing Ports May Have Limited Infrastructure (Demand>>>Capacity)

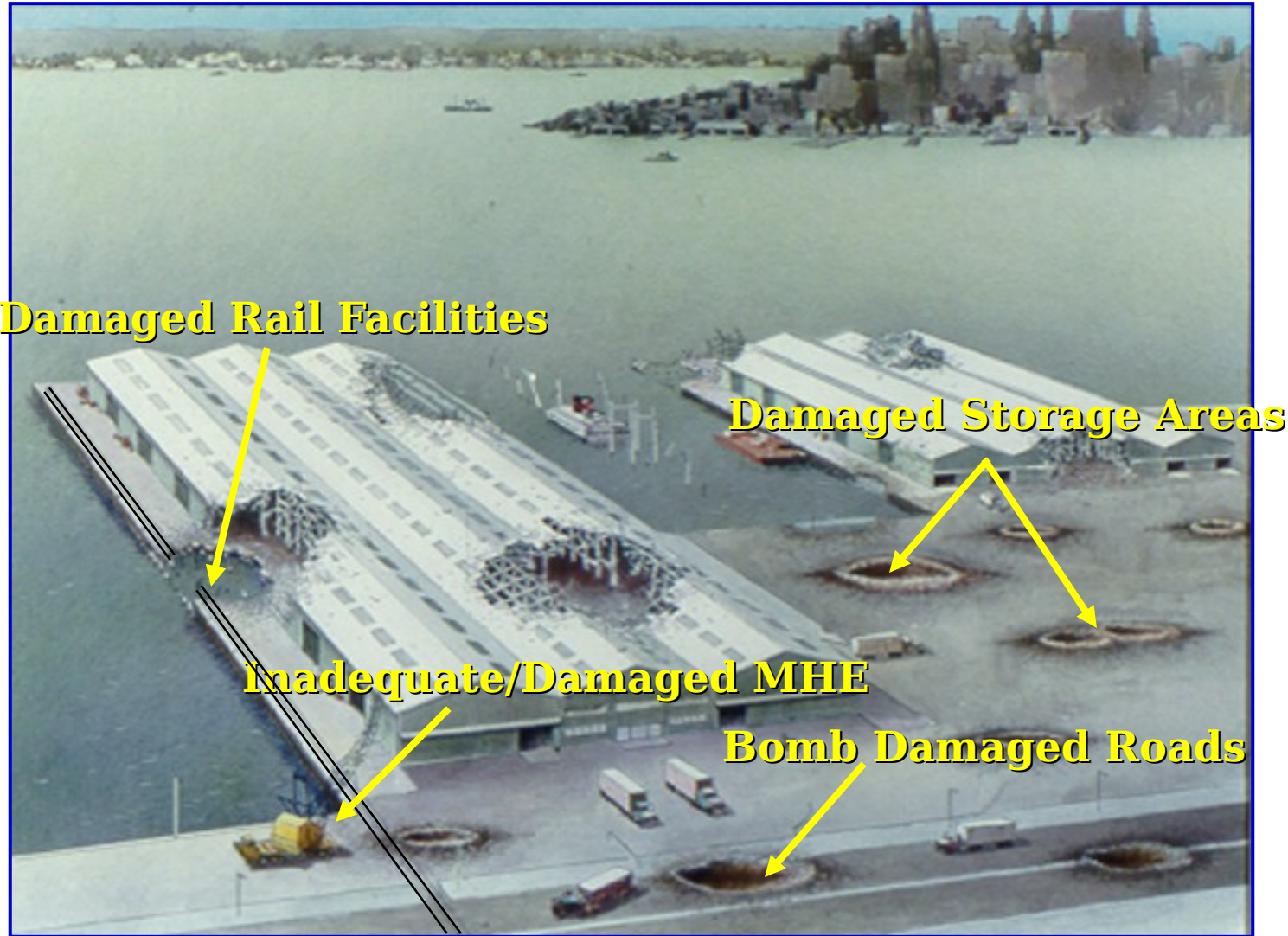**Links to Transportation Networks Are Inadequate For Required Throughput**

Existing Facilities May Be War-Damaged

Storage Facilities or Marshalling Yards Are Nonexistent or Inadequate

Rail Facilities Are Easily Sabotaged

PROBLEM

Concept:

Damaged Rail Facilities

Damaged Storage Areas

Inadequate/Damaged MHE

Bomb Damaged Roads

PROBLEM

Reality: (Circa 1944)

APPROACH

Infrastructure Development/Enhancement (I

4 Wheels of RIDE:

- **Rapid Structural Repair**
  - Pier Enhancement
  - Advanced Materials

- **Emergency Crater Repair**
  - Piers
  - Marshalling Yards and Roads

- **Storage Facility Development**
  - Reduced Logistics Design

- **Assessment and Repair of Railroads**
  - Determine Rail Condition & Capacity
  - Expedient Construction of Rail Linkages
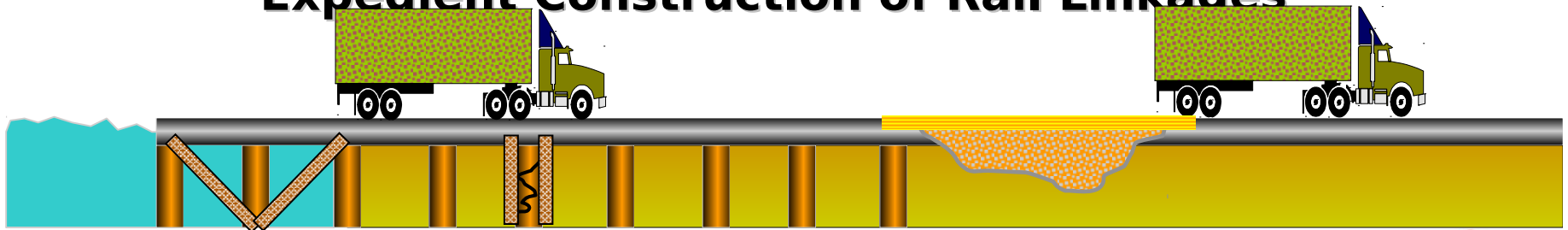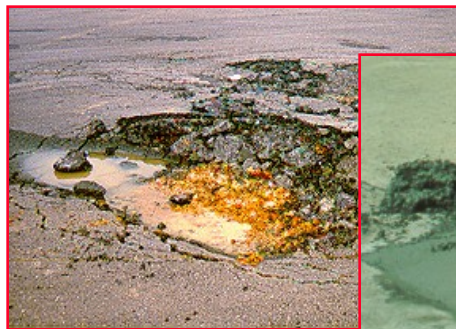
Rapid Structural Repair

Objective:

Demonstrate advanced materials for expedient repair of roads and piers.

Approach:

- Leverage Technologies Developed Under LOC Work Packages
- Modify Techniques and Procedures For Port Facilities

Technologies:

- Rapid Setting Cements & Polymer Resins
- Fiber-Reinforced Plastic (FRP) Panels
- Geosynthetic-Wrapped Colu...

Emergency Crater Repair

Objective:

Demonstrate materials and techniques for expedient crater repair.

Approach:

- Determine Structural Requirements For Road Repairs
- Reconfigure Airfield Bomb Damage Repair Kits Developed In 1980s
- Evaluate New Materials

Technologies:

- Reduced Footprint Multi-Purpose (MP) Mat
- Heavy Duty DURA-BASE/AM2 Mat for Temporary
- Advanced Anchoring Systems
- Composite Reinforcement Materials
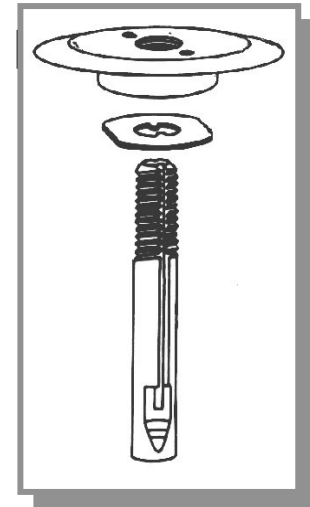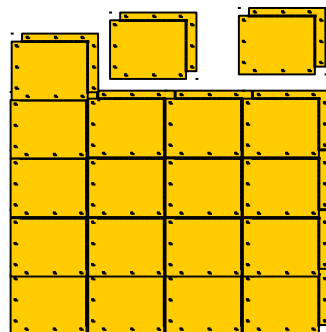
Storage Facility Development

Objective:

Demonstrate materials and techniques for rapid construction of marshalling yards and storage facilities.

Approach:

- Determine Structural Requirements Based Upon Traffic
- RTCH Loads Require 30-inches of Crushed Stone Over Soft Soil
- Evaluate Lightweight Composites to Reduce Cross Sections

Technologies:

- Geosynthetic Separators/Reinforcement/Drainage for Heavy Loads
- Chemical Stabilizers For Heavy Loads
- Composite Mat Systems to Support Container Loads

ERDC
Engineer Research and Development Center

Assessment & Repair of Railroads

Objective:

Demonstrate rapid assessment technologies and construction materials for railroad development/enhancement.

Approach:

- MTMC Anticipates 80% of OCONUS Throughput By Rail - ADCSOPs
- Develop/Demonstrate Hand-Held Rail Assessment Technologies

Technologies:

- Demonstrate Rapid Track Construction with Geosynthetics
- Simplistic Hand-Held Tools For Rail Condition Assessment
- Plastic Cross-Ties For Track Alignment
- Geotextiles/Geogrids/Lightweight Fill For Rapid Ballast Construction

RIDE Funding

Original RIDE Work Package:

Work Unit Title	FY03	FY04	FY05	FY06	FY07
Proposed RIDE Work Units					
Technology Application Assessment	150				
Crater Repair Kit Development	300	450	500	300	
Rapid Rail Assessment Technologies	300	350	350	200	
Structural Design of Railroad Sections	300	400	500	500	
Structural Repair of Piers	350	500	500	350	
Structural Design of Storage Facilities		200	400	400	
Expedient Pavement Repair Materials			150	250	
Infrastructure Enhancement Demonstration				400	1800
Program Total:	1,400	1,900	2,400	2,400	1,800

ERDC Groups:
➢ **Airfield and Pavements Branch – GSL**
➢ **Structural Mechanics Branch – GSL**
➢ **Concrete Materials Branch - GSL**
➢ **Construction Engineering Research Laboratory (CERL)**

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Summary

Objective:

Demonstrate Materials & Techniques to Rapidly Develop/Enhance Infrastructure.

Focus Areas:

- Rapid Structural Repair
- Emergency Crater Repair
- Storage Facility Development
- Assessment and Repair of Rail Facilities

Metrics:

Capability	Proposed Objectives	
	Minimum	Goal
Rapid Assessment	20% Reduction	25% Reduction
Reduced Materials		
Weight	25% Reduction	30% Reduction
Volume	25% Reduction	30% Reduction
Time	30% Reduction	40% Reduction
Affordability	20% Reduction	30% Reduction
TRL	5 to 6	5 to 7